



UNITED STATES DEPARTMENT OF COMMERCE

Patent and Trademark Offic

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/579, 402 05/25/00 KO

K 11675.114.1

EXAMINER

MM91/0119

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| ART UNIT | PAPER NUMBER |
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2815

DATE MAILED:

01/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

| | | |
|------------------------------|-----------------|--------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/579,402 | KO, KEI-YU |
| | Examiner | Art Unit |
| | Eugene Lee | 2815 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 May 2000.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 May 2000 is/are objected to by the Examiner.
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) Notice of References Cited (PTO-892)
- 16) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 18) Interview Summary (PTO-413) Paper No(s). _____
- 19) Notice of Informal Patent Application (PTO-152)
- 20) Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the contact plug must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Claim Objections

2. Claims 3, 10, 13, and 19 are objected to because of the following informalities:
- a. there is an additional “of” on line 8 of claim 10.
 - b. the word “integral” in claims 3, 10, 13, and 19 is indefinite. It is unclear what the applicant considers as “integral.”

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Applicant recites claims 14 thru 17 as being dependent on “a process” when there are no process claims in the application. The Offices provisionally assumes that the applicant intended to recite “structure” instead of “process” for the purposes of examination. However, appropriate confirmation and correction are required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4-8, 10-12, 14-18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blalock '517 in further view of Iyer et al. '455. In FIG. 8B, Blalock shows a word line (gate stack structure) 32 comprising a substrate (base semiconductor material) 30, gate oxide layer, gate layer, layer of refractory metal silicide, cap, spacers, conductive material (contact plug) 41, BPSG layer (layer of doped silicon dioxide) 34. Blalock does not disclose the cap as undoped silicon dioxide layer but instead, a nitride layer. However, Iyer shows that undoped silicon dioxide is also used in the caps of gate stack structures (see, for example, column 2, lines 34-). Therefore, it would have been obvious to one of ordinary skill in the art at time of invention to substitute an undoped silicon dioxide layer for the nitride layer (in Blalock's invention) since both types of layers are often used in the art as dielectric caps.

a. Blalock does not explicitly state the identity of the partial elements (i.e. gate oxide layer, gate layer, layer of refractory metal silicide, cap, spacers) present in the gate stack structure 32. However, the gate stack structure 32 was well known to have these elements and are clearly identified in Prior Art, as explained below.

7. Claims 3, 9, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blalock in view of Iyer as applied to claims 1, 2, 4-8, 10-12, 14-18, 20 above, and further in view of Joshi et al. '417. Blalock in view of Iyer does not disclose the spacer as undoped silicon

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dioxide. However, Joshi shows that undoped silicon dioxide is also used in the spacers of gate stack structures (see column 3, lines 32-). Therefore, it would have been obvious to one of ordinary skill in the art at time of invention to substitute undoped silicon dioxide for silicon nitride in the spacers of Blalock in view of Iyer since both materials are often used in the art as dielectric spacers.

Prior Art

8. The prior art of made of record and not relied upon is considered pertinent to applicant's disclosure. See Dennison '681 where it enunciates the gate oxide, polysilicon layer, silicide layers, insulating caps, and insulating spacers of a conventional gate stack structure (see, for example, column 3, lines 17-).

INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Eugene Lee
January 16, 2001



EDDIE C. LEE
PRIMARY EXAMINER